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brates. The difference in the results obtained by the two methods has been so great that I could not be induced to return to the former method. The course of the second type has, in its results, utterly outclassed that of the first sort at all points, even in pure training in observation, for observation must include a conception of the adaptations in the phenomena observed. Even students who plan to study medicine are, I am sure, far better prepared to study with intelligence human embryology than if they had given their attention wholly or chiefly to amniote embryos in which the space relations of the organs are so distorted by secondary influences.

Material for the elementary cytological work and the study of cleavage and gastrulation is easy to prepare and also can readily be purchased, and there is no difficulty, of course, in obtaining frog embryos and larvæ. The yolk in the earlier embryos necessitates careful work in preparing sections, but, by avoiding absolute alcohol and by using an oil that does not make the yolk too brittle, good preparations are readily obtained. The labor of preparing sections of frog embryos and larvæ seems no greater than that of preparing chick sections. At any rate, the labor is not such as to lead one, in order to avoid it, to choose less instructive material for study.

Perhaps no clearer text-book has ever been written than Marshall's "Vertebrate Embryology." In spite of some inaccuracies, and of not being up to date, it is still usable, but its cost is considerable, and it contains more than most introductory embryological courses can cover. Holmes's volume, "Biology of the Frog," gives insufficient treatment to the embryology, and Marshall's little book, "The Frog," is no more adequate on this side. Morgan's "Development of the Frog's Egg" is not adapted for an introductory embryological course. We greatly need an embryology of the frog. A revision of Marshall's chapters on this subject, and their publication as a separate volume would well meet this need. Were there such a volume obtainable, one would not fear harm from the publication of Lillie's "Development of the Chick," for courses of each type would then have a satis-

factory text-book and an unbiased choice would be possible; but under present conditions one does fear that the very excellence of Lillie's book will serve to perpetuate an unfortunate tradition and will delay the general coming of embryological courses that are a better preparation for general morphological study.

M. M. METCALF

THE COUNTRY BOY AGAIN

IN SCIENCE, February 12, in discussing industrial education, I made the statement that with only 29 per cent. of our population actually living on the farm, with miserably poor school facilities as compared with our city population, this 29 per cent. furnishes about 70 per cent. of the leaders in every phase of activity in this country. This statement was quoted from memory and was in error to the extent that I should have said 29 millions of our population instead of 29 per cent. Dr. Frederick Adams Woods, in SCIENCE, April 9, quotes this statement and adds some criticisms.

First, I want to assure Dr. Woods that I appreciate very fully the magnificent work he did in his study of heredity in royalty. It fell to my lot to review Dr. Woods's book, and I found it one of the most interesting treatises on heredity we have. He has demonstrated, I think, beyond cavil, that "native ability and natural impulses of human beings are as much a matter of heredity as are any physical characteristics."

The above quotation is from my review of Dr. Woods's paper in my article on Mendel's law, which will appear soon in Volume V. of the American Breeders' Association. In that review I say further:

Prodigious effort has been made by the human race to better its condition but this effort has been wholly in the direction of improving the environment. While Dr. Woods has shown that it is really an unimportant factor in determining natural impulses and native ability, it is true that when environment is unfavorable it may prevent the development of natural tendencies or may warp them, and it may also result in great

natural ability remaining practically useless for a lack of the implements which a full development of intellectual power would place in its hands. But improving the environment does not from generation to generation give better material for our schools to work on.

I have only one criticism of Dr. Woods's reasoning. In studying heredity in royalty he purposely chose this class because it could be assumed that their characters were formed under the most uniform environment, which purpose was of course entirely legitimate. But it must be remembered that this environment is the best possible for the development of character and ability. It would be gratifying to me to see Dr. Woods make a similar study of some class of human beings subjected to an unfavorable environment. I believe he would find, as I have stated above, that even in that class native ability and natural impulses would prove to be purely a matter of heredity; but that character and actual ability would be found to be profoundly modified by environment. In fact, the whole experience of the human race speaks for this assumption. If the opposite were true, then why should the state go to the expense of maintaining schools, for a man's effectiveness would not depend on his environment, but upon his inheritance.

I have a further criticism to offer of Dr. Woods's article in *SCIENCE*. In the first place, the men listed in "Who's Who in America" do not represent leaders, although they include leaders. Dr. Woods's own figures prove the effect of environment as against heredity. For instance: under the initial A he finds 29.6 per cent. of city born individuals instead of the 16.1 per cent. expected on the basis of population. This merely shows that of the men in "Who's Who in America," those who have had the best opportunities have done best. "Who's Who in America" lists those men who have done something of note. I am inclined to believe that fully half of these men owe their success to their opportunities. They are not leaders, though they are competent workers, and they are not the type of men I had in mind in my previous article.

Census statistics do not easily lend them-

selves to the determination of the proportion of our population who actually live on farms. In rural population they include cities of considerable size. It has been said that "God made man, man made the cities, and the Devil made the country village." I have no way of ascertaining how many of the men who are distinctly leaders in this country were actually brought up on the farm. I am inclined to believe that the conditions in country villages and small towns are less favorable for the development of character than those on the farm or those in great cities.

I have not had time to secure extensive statistics on the birth-place of men who have been and are leaders in the various lines of activity in this country. In my previous article I merely repeated a statement I have heard frequently, and which I had never heard challenged. From the best statistics I can secure, about 36 per cent. of our population actually live on the farm at the present time. Of the 25 presidents of the United States, 23 of them were country bred, or were brought up under what the census terms rural conditions, only our present president and his immediate predecessor having been brought up in the city, so far as a hasty glance at history and biography reveals. This is 92 per cent. of the total, and there is no question that these men have been leaders. Of the present membership of the United States senate, in so far as the congressional directory reveals the facts, 70.5 per cent. are country bred. The statistics for the house of representatives are not so conclusive. The fact that many congressional districts are wholly city districts while others are wholly country districts vitiate the statistics for that branch of congress, so far as our purpose is concerned.

I hope to be able, in the not distant future, to present other statistics bearing on this question. I believe, however, that when we consider the fact that our country schools have always been vastly inferior to our city schools, the few data given above show that there is something in farm life, during the first few years of the boy's training, that tends more nearly to give normal expression to his hereditary talents and impulses than do con-

ditions of city or village life. The matter must rest here until further statistics are available.

W. J. SPILLMAN

U. S. DEPARTMENT OF AGRICULTURE

THE RELATION OF THE METER AND THE YARD

TO THE EDITOR OF SCIENCE: It is a matter of astonishment to me that so many men, authors of scientific books, are ignorant of the fact that the relation between the meter and the yard is in the United States fixed by law, viz., 1 meter = 39.37 inches. In England the established relation is 1 meter = 39.370113 inches. As examples, see "Fortie's Electrical Engineers' Handbook," 5th Ed., 1908, p. 1500, and "Eggleston's Tables of Weights and Measures," 4th Ed., 1900, p. viii, in both of which the archaic, inherited necessary relation, 1 meter = 39.37079 inches is adopted. In trade catalogues an error of this sort is not so serious and is occasionally made; but in a scientific publication it is unpardonable.

MARSHALL D. EWELL

SCIENTIFIC BOOKS

Primitive Secret Societies. A Study in Early Politics and Religion. By HUTTON WEBSTER, Ph.D., Professor of Sociology and Anthropology in the University of Nebraska. New York, The Macmillan Co. 1908. Pp. xiii + 227.

This book, which has served in its original form as a thesis for the doctorate in political science at Harvard University, treats, in eleven chapters, of the men's house, the puberty institution, the secret rites, the training of the novice, the power of the elders, development of tribal societies, functions of tribal societies, decline of tribal societies, the clan ceremonies, magical fraternities, diffusion of initiation ceremonies. The author's studies were concluded before he became acquainted with the late Dr. Heinrich Schurtz's "Altersklassen und Männerbünde" (Berlin, 1902), of which, however, he was able to make some use in the present monograph. The book of Schurtz, rather *tendenziös* in places and somewhat marred by a philological appendix, but, nevertheless, an interesting and valuable

summary of facts, was preceded by Boas's (1895-7) investigations of the social organization and secret societies of the Indian tribes of the North Pacific coast (particularly the Kwakiutl), which still remain the best source of information for that region, as yet not adequately used by any authority. For the Plains tribes we have recent investigations by Wissler, Dorsey, Fletcher, Kroeber, and for the Pueblos Indians, those of Fewkes, etc. The material in Dr. Webster's book, as is the case with all others dealing generally with the topic of secret societies and ceremonies, is preponderatingly Australasian, Indonesian and African, though at pages 15-19 ("men's house"), 131-134 (age-societies), 147-159 (clan-ceremonies) and 176-190 (magical fraternities), the aborigines of the new world receive particular attention.

The author begins with the "men's house," described as follows:

The men's house is usually the largest building in a tribal settlement. It belongs in common to the villagers; it serves as council-chamber and town hall, as a guest-house for strangers, and as the sleeping resort of the men. Frequently seats in the house are assigned to elders and other leading individuals according to their dignity and importance. Here the more precious belongings of the community, such as trophies taken in war or in the chase, and religious emblems of various sorts, are preserved. Within its precincts, women and children, and men not fully initiated members of the tribe, seldom or never enter. When marriage and exclusive possession of a woman do not follow immediately upon initiation into the tribe, the institution of the men's house becomes an effective restraint upon the sexual proclivities of the unmarried youth. It then serves as a club-house for the bachelors, whose residence within it may be regarded as a perpetuation of that formal seclusion of the lads from women, which it is the purpose of the initiation ceremonies in the first place to accomplish. Such communal living on the part of the young men is a visible token of their separation from the narrow circle of the family, and of their introduction to the duties and responsibilities of tribal life. The existence of such an institution emphasizes the fact that a settled family life with a private abode is the privilege of the older men, who alone have marital rights over the women of the tribe. For promiscuity,